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ART 34 AND 35

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## Claims

1. A biologically active complex comprising alpha-lactalbumin  
or a variant of alpha-lactalbumin ( $\alpha$ -lactalbumin) which is in the  
5 apo folding state, or a fragment of either of any of these, and a  
cofactor which stabilises the complex in a biologically active  
form, provided that any fragment of  $\alpha$ -lactalbumin or a variant  
thereof comprises a region corresponding to the region of  $\alpha$ -  
lactalbumin which forms the interface between the alpha and beta  
10 domains, and further provided that when the complex comprises  
native  $\alpha$ -lactalbumin, the cofactor is other than C18:1:9 cis  
fatty acid.
2. A complex according to claim 1 wherein the cofactor is a cis  
15 C18:1:9 or C18:1:11 fatty acid or a different fatty acid with a  
similar configuration.
3. A biologically active complex according to claim 1 which is  
obtainable by combining  
20 (i) a cis C18:1:9 or C18:1:11 fatty acid or a different fatty  
acid with a similar configuration; and  
(ii)  $\alpha$ -lactalbumin from which calcium ions have been removed, or  
a variant of  $\alpha$ -lactalbumin from which calcium ions have been  
removed or which does not have a functional calcium binding site;  
25 or a fragment of either of any of these, provided that any  
fragment comprises a region corresponding to the region of  $\alpha$ -  
lactalbumin which forms the interface between the alpha and beta  
domains, and further provided that when (ii) is alpha-  
lactalbumin, (i) is other than C18:1:9 cis fatty acid.  
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4. A complex according any one of claims 1 to 3 which includes  
a variant of  $\alpha$ -lactalbumin in which the calcium binding site has  
been modified so that the affinity for calcium is reduced, or it  
is no longer functional.

5. A complex according to claim 4 wherein the variant as a mutation at one of the K79, D82, D84, D87 and D88.
6. A complex according to claim 4 wherein the modification is at D87 which includes a variant of  $\alpha$ -lactalbumin having a D87A or D87N variants.
7. A complex according to any one of the preceding claims which comprises a fragment of  $\alpha$ -lactalbumin or a variant thereof, and where the fragment includes the entire region from amino acid 34-86 of the native protein.
8. A complex according to any one of the preceding claims wherein the  $\alpha$ -lactalbumin is human or bovine  $\alpha$ -lactalbumin or a variant of either of these.
9. A complex according to claim 8 wherein the  $\alpha$ -lactalbumin is human  $\alpha$ -lactalbumin.
10. A complex according to claim 8 wherein the  $\alpha$ -lactalbumin is mutant bovine  $\alpha$ -lactalbumin which includes an S70R mutation:
11. A complex according to any one of the preceding claims which further comprises calcium ions.
12. A pharmaceutical composition comprising a complex according to any one of the preceding claims in combination with a pharmaceutically acceptable carrier.
13. A method for treating cancer which comprises administering to cancer cells a complex according to any one of claims 1 to 11 or a composition according to claim 12.

14. A method for treating bacterial infections which comprises administering to a patient in need thereof, a complex or a composition as described above.